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DESCRIPTIONS OF NEW ANT-LIKE AND MYRME- COPHILOUS HYMENOPTERA.

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Laboratory of the U. S. Fish Commission, Woods Hole, Mass Sept. 6, 1902.

The present descriptions and notes are based upon Hymenoptera collected while searching for ants and myrmecophiles. As many insects not associated with ants are found at such times, only those are included which are evidently myrmecophilous or which resemble ants in form and habitus. All of the ten new species belong either to the Proctotrypoidea or Ichneumonidæ, two groups rich in myrmecophilous and ant like species.

NORTH AMERICAN SPECIES OF PEZOMACHUS.

Females.

- | | |
|---|---------------------------------|
| Head black or piceous..... | 2. |
| Head rufous or yellowish..... | 12. |
| 2. Thorax at least in part black or piceous..... | 3. |
| Thorax wholly reddish | 10. |
| 3. Thorax uniformly piceous brown or black..... | 4. |
| Thorax bicolored | 8. |
| 4. Abdominal petiole wholly black | 5. |
| Abdominal petiole with pale band at apex..... | 7. |
| Abdominal petiole brown, antennæ stout..... | 4. californicus Ashm. |
| 5. Legs, including coxæ, wholly reddish or yellowish..... | 6. |
| Legs, or at least coxæ and femora black; antennæ 18-jointed. | |
| | 1. nigrellus Ashm. |
| 6. Anterior lobe of thorax longer than the posterior one; antennæ 19-jointed. | |
| | 2. obesus Ashm. |
| Posterior lobe longer than anterior..... | alaskensis Ashm. |
| 7. Lateral tubercles of abdominal petiole not prominent; ovipositor as long as the petiole; antennæ 21-jointed..... | 5. pettitii Cress. |
| Lateral tubercle very prominent; ovipositor as long as first two abdominal segments; antennæ 22-jointed | 6. angularis sp. nov. |
| 8. Thorax with anterior node ferruginous, posterior one more or less black.. | 9. |
| Thorax black, with ferruginous antennæ 19-jointed. | |
| | 8. maculicollis sp. nov. |
| 9. First abdominal segment with prominent tubercles and scarcely dilated behind them; antennæ 23-jointed | 9. gentilis Cress. |
| First abdominal segments broad with inconspicuous tubercles, and much dilated behind them; antennæ 20-jointed..... | 10. wheeleri sp. nov. |
| 10. First segment only of abdomen pale | 7. tantillus Cress. |
| First two of abdominal segments at least in part pale..... | 11. |

11. First and second abdominal segments wholly yellowish; antennæ 22-jointed
 11. **canadensis** Cress.
 First segment wholly yellowish, second pale banded... 12. **obscurus** Cress.
12. First abdominal segment very long and unusually slender, scarcely dilated at tip; antennæ 21-jointed 13. **texanus** Cress.
 Head and thorax dark, abdomen except petiole dark.
 var. **nigriventris**.
 First abdominal segment not unusually slender..... 13.
13. Abdomen wholly ferruginous, sometimes very slightly infuscated..... 14.
 Abdomen in great part black or piceous 15.
14. Ovipositor as long or longer than the abdomen; antennæ 24-25-jointed.
 14. **unicolor** Cress.
 Ovipositor a little longer than the abdominal petiole, antennæ with more than 23 joints 15. **crassulus** sp. nov.
 Ovipositor very short; antennæ 19-26 jointed..... **keenii**.
15. Small species, 2.5 mm. or less, first and second abdominal segments rufous; antennæ 18-jointed 17. **minimus** Walsh.
 Larger, over 4 mm., or differently colored..... 16.
16. Ovipositor very short, third and following segments pale behind.
alternatus Cress.
 Ovipositor at least about as long as the first abdominal segments..... 17.
17. Anterior lobe of thorax with a median longitudinal groove; antennæ 24-jointed 19. **dimidiatus** Cress.
 Anterior lobe of thorax not thus sulcate..... 18.
18. Tip of abdomen pale 22.
 Tip of abdomen dark or banded 19.
19. Abdominal petiole black, with a yellow apical band; tip of abdomen piceous.
 20. **meabilis** Cress.
 Petiole rufous or ferruginous 20.
20. Tip of abdomen banded 21. **micariæ**.
 Tip of abdomen black 21.
21. Antennæ 23-jointed 22. **ottawaënsis**.
 Antennæ more than 23-jointed 23. **flavocinctus** Ashm.
22. Petiole much dilated apically; second, third and fourth segments ferruginous; antennæ 19-jointed..... 25. **birkmani** sp. nov.
 Petiole but slightly dilated; third and fourth segments more or less fuscous; antennæ 25-jointed 26. **gracilis** Cress.

Males.

- Apterous 2.
 Winged 5.
2. First abdominal segment very long and slender, scarcely dilated apically, considerably longer than the metathorax 13. **texanus** Cress.
 First abdominal segment shorter and broader 3.
3. Head black; small species..... 4.
 Head yellowish brown; antennæ 27-jointed..... 27. **macer** Cress.
4. Abdomen wholly black; antennæ 20-jointed **nigrellus** Ashm.
 Abdomen pale banded..... 17. **minimus** Walsh.

5. Head and thorax black 6.
 Head black; prothorax, legs and abdomen, except apex, yellowish or ferruginous.....9. **gentilis** Cress.
 6. Black, with segments 2 and 3 of abdomen yellowish.....**ottowaënsis**.
 Head, thorax and abdomen above black.....28. **insolitus** How.
 Head and thorax dull black, abdomen wholly rufous....21. **micariæ** How.

Pezomachus Birkmani sp. nov.

Female.—Length 3.5 mm.—Slender, yellowish ferruginous, except a piceous spot at the base of the abdominal petiole, narrow piceous band at base of third abdominal segment, black tips of mandibles and infuscated apical joints of antennæ. Antennæ stout, 19-jointed, somewhat thickened toward the apex, almost as long as the body, their joints shorter than usual, the eighth flagellar joint being no longer than wide. The joints annulate with black from third joint, the rings becoming wider and the joints wider apically. Ocelli equidistant, the posterior ones about equidistant from one another and the eyes, each ocellus surrounded by a very small elongate black spot. Thorax more sharply constricted than usual between meso- and metathorax. Mesonotum not impressed, its lateral dentiform processes distinct, the dorsum evenly but not very convex and much longer than the metathorax. Metathorax rather sharply declivous behind, more sharply convex anteriorly, its posterior face very finely rugose, separated from the dorsum by a fine raised line which is interrupted medially. Abdominal petiole rather long, its lateral teeth large and distinct. Abdomen more shining than the head and thorax, ovate, first and second segments yellow ferruginous; a piceous band at the base of the third; following segments darker. Legs yellowish ferruginous. Ovipositor about one and one-half times as long as the abdominal pedicel.

A female specimen collected at Fedor, Lee County, Texas, by Rev. G. Birkman, on April 1, 1901.

This species comes near to *alternatus* Cress., and like it has the antennal joints unusually short. It differs from the latter in having a long ovipositor which extends beyond the tip of the abdomen for a distance considerably greater than the length of the petiole of the abdomen.

Pezomachus maculicollis sp. nov.

Female.—Length 2.5 mm. Black, with ferruginous markings. Head black, not shining; face below antennæ ferruginous except for a longitudinal stripe below each antennæ. Mandibles reddish black at the bidentate tips. Palpi fuscous. Antennæ pale ferruginous, with dark incisures at the joints and blackened on apical fourth, 19-jointed. Cheeks fuscous below. Thorax black, not shining; collar rufous on the sides, mesonotum with a ferruginous V-shaped spot pointing anteriorly, a small ferruginous spot each side of the apex of the V. Metathorax with two ferruginous dorsal spots. Posterior lobe of the thorax much more strongly and sharply convex than the anterior lobe and about as long. Posterior face of metathorax bordered by a sharp carina, finely rugose; thorax elsewhere delicately punctate. Scutellum absent. Abdomen piceous black, subclavate; first segment rather short and broad and gradually dilated posteriorly; piceous-brown

in front and yellowish behind. Second and following segments shining piceous, with a few short white hairs, second very narrowly reddish posteriorly. Ovipositor exceeding tip a little more than length of first abdominal segment. Legs luteous, more or less darkened on the coxæ, femora and tibiæ.

Described from a female specimen collected in nest of *Leptothorax longispinosus* Roger. *P. maculicollis* is readily recognized by its small size and by the ferruginous markings on the thorax. It evidently mimics the ant with which it lives, resembling it greatly in size, color and general habitus.

I have also a single ♂ and ♀ collected at Woods Hole, Mass., which belong perhaps to this species. The thoracic spots are very faint in the ♀, which has 20-jointed antennæ and more distinct tubercles on the petiole than *P. maculicollis*. The apterous male has also 20-jointed antennæ and a narrow scarcely dilated black petiole. The legs are slightly darker than in the ♀.

Pezomachus texanus Cress.

This species occurs at Austin, Texas, associated with the ant *So lenopsis geminata* Fabr. A male specimen collected by Dr. William M. Wheeler in a nest of the same ant at Corpus Christi, Texas, proves to be wingless. It differs from the female in having the antennæ almost as long as the body; the head entirely honey yellow; scutellum very distinct (it is very faintly separated in the female). The pedicel and whole abdomen, as well is much elongated. The antennæ are 22-jointed; they are 21-jointed in the female.

Var. *nigriventris*.—Several females from Austin, Texas, differ from the typical form in having the head and thorax dark ferruginous, and the whole abdomen behind the petiole shining black.

Pezomachus angularis sp. nov.

Female.—Length 2.75 mm. Small, slender, black. Tip of petiole and abdomen pale. Head shining, rather densely and finely punctured; black above, deep yellow in front below the antennæ and below on the cheeks behind. Mandibles and palpi luteous, the former black at the tips. Antennæ slightly longer than the body, 22-jointed, yellowish at base and infuscated apically. Thorax slender, the anterior and posterior lobes very nearly equal, the posterior one more strongly arched; fuscous or piceous brown, lighter on the sides of the pro- and mesothorax. Mesonotum finely punctured, not sulcate. Metathorax more coarsely punctured, especially behind, without any keels. Abdominal petiole with its lateral tubercles very prominent, behind which it is constricted and then widens out to the apex, where it is no wider than at the tubercles. Petiole piceous, paler at base and with a luteous band at apex. Abdomen elongate oval, rather slender, scarcely wider than the head; shining and sparsely finely sericeous pubescent. Second to

fifth segments piceous black, apical segments pale yellowish. Legs dark fuscous, trochanters, sutures and apices of tarsi paler. Ovipositor as long as first and second segments together, ferruginous.

Described from one female specimen collected at Austin, Texas, May, 1902.

This species resembles *Pettitii*, but is smaller and has a differently formed abdominal petiole.

Pezomachus crassulus sp. nov.

Female.—Length 4.5 mm. Large and stout, ferruginous, slightly infuscated on the abdomen. Head ferruginous, slightly darker on the occiput, rather finely punctate and not at all shining, very sparsely silvery pruinose. Face considerably produced just at the base of the antennæ. Mandibles deep yellow, black at the tips; palpi rufous. Antennæ short, stout (broken), thickened toward the tips and probably reaching about to the base of the second abdominal segment. Rufous at base, paler and with dusky incisures toward the tip; with at least 23 joints. Thorax short and stout, less strongly bilobed than usual, the lobes of equal length, ferruginous. Mesonotum sculptured like the head. Metanotum indistinctly areolated in front, distinctly so behind. Petiole gradually widened out towards its apex, the lateral tubercles not prominent; longitudinally aciculated above and sparsely covered with sericeous pubescence. Abdomen very shining, sparsely punctulate and thinly pubescent; broadly oval; ferruginous except at the base of the second and third segments where it is slightly infuscated. Legs dark ferruginous throughout.

Described from a single female collected under a stone at Austin, Texas, during April, 1902.

This fine species resembles *unicolor* Cress. in color, but is readily separated by the characters given in the table, and by its opaque head and thorax.

Pezomachus Wheeleri sp. nov.

Female.—Length 3.5 mm. Rather stout, black, with reddish markings. Head large, black, finely punctured, mandibles black; palpi testaceous, cheeks smooth and very shining, face not produced at the base of the antennæ. Antennæ piceous, paler towards base, especially below; 20-jointed. Thorax strongly bilobed; anterior lobe dark ferruginous, with darker humeral marks; posterior one black; slightly ferruginous on the anterior upper face. Posterior lobe longer and more convex. Mesonotum slightly longitudinally impressed medially, metanotum smooth, very finely shagreened, with a delicate carina laterally, which is interrupted above. Abdominal petiole very short and broad, gradually dilated to the apex, dark rufous. Its lateral tubercles not at all prominent; abdomen very broad behind the petiole, regularly oval; shining black, except for the narrow dark yellow border of the second segment and a faint trace of narrower light borders on the third and fourth segments. Ovipositor exceeding the apex of the abdomen by the length of the petiole. Its sheaths pale at base and piceous at tips. Legs piceous, the trochanters, knees, anterior tibiæ at tip, and all the tarsi more or less rufotestaceous.

Described from a female specimen collected at Rockford, Ill., by Dr. William M. Wheeler, to whom I take great pleasure in dedicating this species.

1. <i>Nigrellus</i> ,	1.5-2	mm.	Alaska.	15. <i>Crassulus</i> ,	4.5	"	Tex.
2. <i>Obesus</i> ,	3.5	"	Alaska.	16. <i>Keeni</i> ,	3-4	"	B. C.
3. <i>Alaskensis</i> ,	2.6	"	Alaska.	17. <i>Ninimus</i> ,	2-2.5	"	Tex.,
4. <i>Californicus</i> ,	2.4	"	Cala.		Mo., Ill.		
5. <i>Pettiti</i> ,	3.5	"	Ontario.	18. <i>Alternatus</i> ,	4.5	"	Ill.
6. <i>Angularis</i> ,	2.75	"	Tex.	19. <i>Dimidiatus</i> ,	4.25	"	Mass., Ill.
7. <i>Tantillus</i> ,	2.25	"	Ill.	20. <i>Meabilis</i> ,	3.	"	Ill
8. <i>Maculicollis</i> ,	2.5	"	Ill.	21. <i>Micarixæ</i> ,	5-6	"	D. C.
9. <i>Gentilis</i> ,	3.	"		22. <i>Ottawaensis</i> ,	5-6	"	Canada.
10. <i>Wheeleri</i> ,	3.5	"	Ill.	23. <i>Flavocinctus</i> ,	4.	"	Tex.
11. <i>Canadensis</i> ,	3.25	"	Canada.	24. <i>Berkmanni</i> ,	3.5	"	Tex.
12. <i>Obscurus</i> ,	3.25	"	N. J.	25. <i>Gracilis</i> ,	5.	"	Pa.
13. <i>Texanus</i> ,	4.	"	Tex.	26. <i>Macer</i> ,	5.	"	Pa.
14. <i>Unicolor</i> ,	4-4.5	"	Mass.,	27. <i>Insolitus</i> ,	5.	"	Pa.
			Del., Ill.				

***Ateleopterus virginienensis* Ashm.**

I have two wingless females of this species collected at Round Rock, Texas; the species was originally described from Virginia.

***Mesitius myrmecophilus* sp. nov.**

Female.—Length 3.2 mm. Black, shining, with sparse pale hairs; antennæ and legs brown; wings slightly infuscated. Head scarcely longer than wide, shining black, with widely separated, but very distinct punctures; sparsely covered with rather long whitish hairs. Antennæ 13-jointed, reaching to the tegulæ, dark ferruginous at base, fuscous at tip. Scape short and stout, scarcely equalling one-half the greatest width of the head; pedicel more slender, but scarcely longer than the first flagellum joint. Following three joints quadrate, beyond which they are very slightly longer than wide; apical joint slender, twice as long as wide. Palpi and mandibles ferruginous, the latter dark at extreme tip. Pronotum sparsely and more finely punctured than the head, shining and with short pale hairs, considerably longer than the mesonotum and scutellum taken together; tegulæ ferruginous. Mesonotum impunctate, with two fine longitudinal grooves, which enlarge posteriorly and meet the two large foveæ at the base of the scutellum. Metanotum with a lateral and a median fine raised line and a fainter one between these anteriorly which fades out behind; delicately reticulate. Posterior face with median and lateral raised lines very sharp, separated from the metanotum by a similar line; very finely transversely rugoso-aciculate. Abdomen polished black, impunctured, pale hairy on posterior half. Sixth segment ferruginous at tip. Wings hyaline, basal veins yellow; stigma and radius fuscous. Second basal cell without a backwardly directed vein. Marginal cell long and widely open at tip. Legs rufopiceous.

Described from a ♀ specimen collected in a nest of *Eciton cæcum* at Austin, Texas.

The present species is a typical representative of the genus, and comes nearest to *M. nigropilosus* Ashm. in form, but has pale pubescence and a longer pronotum. It differs from the other species in the form of the head and antennæ.

***Gonatopus peculiaris* sp. nov.**

Female.—Length 2.75–3 mm. Polished black, except the greater part of head, sutures of legs and base of antennæ, which are reddish or yellow. Head distinctly less than twice as wide as long, ferruginous, except a transverse black band between the eyes on the vertex. Mandibles except tips and antennal scape luteous; pedicel and sometimes base of first flagellar joint yellow; remainder of antennæ black. Mesonotum smooth, shining, *evenly arched above* and not emarginate when seen in profile. Metathorax transversely striated before and behind, smooth at the middle. Abdomen polished black. Legs varying from piceous to ferruginous, the coxæ and sutures paler, often luteous. Entire insect very sparsely white pubescent.

Described from four ♀ specimens collected near Austin, Texas, in the early spring. They were seen actively running about on the ground, some near the bank of a stream and the others on dry hill-sides. I have also collected *G. bicolor* Ashm. at Granite Mt., Tex., under stones, and *G. contortulus* Patton upon low herbage, near Woods Hole, Mass., in the same surroundings as the specimens described by Dr. Patton.

This interesting species resembles *G. contortulus* Patton in form and color, but differs from it as well as from the other species of *Gonatopus* in lacking the V-shaped emargination upon the mesonotum.

***Idris nigricornis* sp. nov.**

Male.—Length 2.5 mm. Polished black, legs and antennal scape basally rufous; sparsely covered with pale pubescence. Head shining, very faintly shagreened. Eyes pubescent, lateral ocelli remote from the eye; mandibles rufous. Antennæ black, except the base of the slender scape, which is rufous; pedicel very small, globular; first flagellar joint large, one and one-half times as long as broad, following joints moniliform, slightly smaller than the first; apical joint longer, obtusely pointed. Thorax very sparsely and finely, but sharply punctate; mesonotal furrows deep posteriorly, fading out anteriorly. Pleuræ coarsely punctured in front, polished behind. Scutellum with a punctate frenum and a similar row of punctures along its anterior margin. Metathorax finely rugose, its lateral teeth small and acute. First two abdominal segments longitudinally striate, abdomen elsewhere smooth and shining, rather closely pale pubescent. Legs varying from brown to deep yellow or rufous. Wings hyaline, fringed; basal vein not very distinct, the marginal about three times as long as thick, postmarginal equal to marginal; stigmal twice as long and knobbed at tip.

Described from three ♂ specimens, bred in an artificial nest from a mixed colony of *Myrmica* and *Leptothorax* at Colebrook, Conn., August, 1901.

***Caloteleia Marlattii* Ashm.**

I have numerous specimens of this widely distributed species which were bred by Dr. Wm. M. Wheeler in a mixed nest of *Myrmica* and *Leptothorax* at Colebrook, Conn., August 10, 1901, as well as specimens from Woods Hole, Mass.

All of the males have the abdomen pale at the base, and the third abdominal segment smooth, otherwise they agree well with the description of this species.

***Hemilexodes ambigua* sp. nov.**

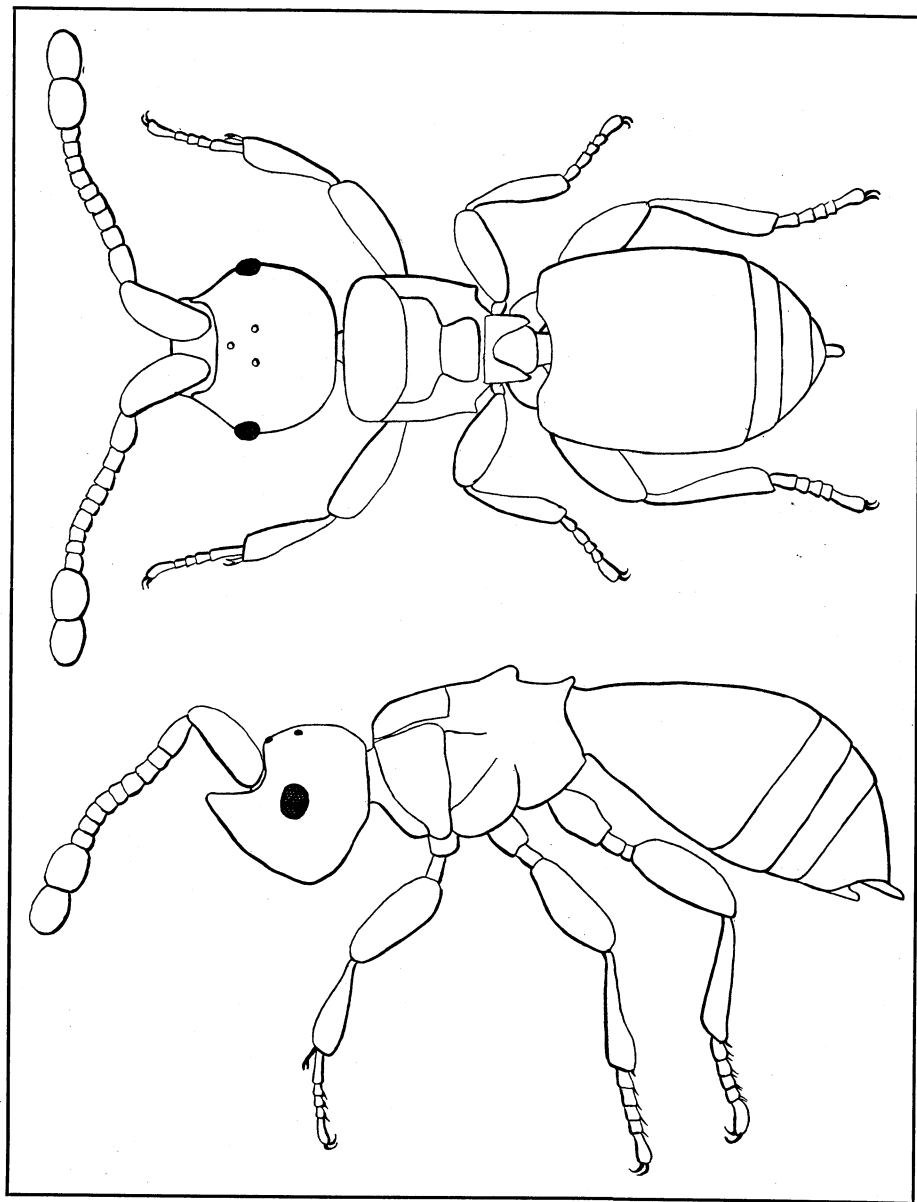
Female.—Length 2.5 mm. Black shining, legs and antennæ, except apex, rufous. Head sparsely pale pilose; mandibles entirely rufous. Antennal scape reaching about to the posterior ocelli, pedicel stouter than first flagellar joint, but of equal length. Second flagellar joint scarcely more than half as long as the first, then the joints become slightly shorter to the fifth which is submoniliform; following joints forming a loosely articulated, 6-jointed spindle-shaped club. The apical joint more slender than penultimate, but longer. Mesonotum sparsely pale hairy, with two distinct furrows. Scutellar fovea deep and broad, its surface longitudinally fluted. Metathorax woolly, coarsely sculptured. Petiole about two and one-half times as long as thick, finely longitudinally striated. Abdomen very shining, black, the petiole below and the base of the second ventral segment sometimes yellowish or rufous. Second segment twice as long as the remaining segments; the abdomen obliquely subtruncate at the apex. Legs yellowish or rufous. Wings strongly fringed, only a slight indication of an emargination at the apex. Stigmal vein about two times as long as the very short marginal vein. Postmarginal vein about half as long as the stigmal.

Described from two female specimens, collected in a nest of *Stenamma fulvum* var. *piceum* at Colebrook, Conn., where it, no doubt, lives parasitically upon myrmecophilous dipterous larvæ.

I have been doubtful whether this species belongs more properly to *Hemilexis* Först, or to *Hemilexodes* Ashm., as it presents characters of each, and again departs somewhat from both in the form of the antennæ and venation.

AUXOPÆDEUTES gen. nov. (see Plate I).

Head orbicular, much produced in front to form a sort of shelf at the base of which the antennæ are inserted. Seen from the side the projection is triangular, with a horizontal upper surface. Antennæ 12-jointed, clavate, the last two joints much enlarged, the penultimate the longest; scape rather short, equal to the last two flagellar



AUXOPÆDEUTES SODALIS GEN. ET SP. NOV.

joints, pedicel as long as the first and second joints of the flagellum. Mandibles bidentate; maxillary palpi 3-jointed, labial 2- (possibly one) jointed. Head narrowed in front of the eyes, the antennal projection about twice as wide as long, sharply rounded on the corners. Eyes greatly reduced, much smaller than the last joint of the antennæ and with few ommatidia. Ocelli large, prominent and arranged in an equilateral triangle upon the vertex, enclosing a space about equivalent to the eye. Thorax quadrate, slightly produced at posterior angles; prothorax nearly half as long as wide, truncate in front rounded behind; mesonotum narrower than pronotum, about three times as wide as long. Wings wholly absent. Scutellum trapezoidal, rounded on the posterior angles; metathorax deeply emarginate in the center, forming two rather acute backwardly directed teeth. Abdominal petiole short. Abdomen somewhat shorter than the head and thorax; basal segment twice as long as the remainder of the abdomen, broadly emarginate at the base, widest just behind the middle. Third and fourth segments about equal, short; last longer. Legs short and stout; femora, especially the four posterior ones, considerably swollen, spur of anterior tibiæ stout and bifid at the tip; those of the other legs not well developed.

Auxopædentes sodalis sp. nov.

Female.—Length 1.25 mm. Fuscous, head piceous, antennæ and legs ferruginous. Body quite hairy, the hairs longest and thickest on the antennæ and the posterior part of the abdomen. Head and thorax smooth and unpunctured. Abdomen with a large deep semi-circular depression at base, sharply bounded in front by the raised anterior margin of the second segment, and rounded behind, almost as wide as the base of the abdomen. First segment obliquely striate at its anterior lateral corners, the abdomen elsewhere smooth and convex.

Described from a female specimen collected by Dr. Wm. M. Wheeler on the banks of Bull Creek, Travis Co., Texas. It was found in a nest of *Solenopsis molesta*, and is undoubtedly a true myrmecophile of this minute ant.

The form of the antennæ recall somewhat those of *Solenopsis* Wasmann, but the insect is otherwise quite different and I have not been able to determine its systematic position with any degree of assurance, placing it in the Diapriidæ, although it resembles members of the Belytidæ in having a large pronotum. The antennæ resemble those of the Diapriidæ in having 12 joints. The number of antennal joints in ant-nest inhabiting forms tends to be unusual,

however, and the antennæ often resemble greatly those of the host ant; as is seen in this case to a remarkable degree. For this reason the form of the antennæ may not be so valuable for classification as other characters.

The general habitus of this form is like that of *Solenopsia imitatrix* Wasmann, a peculiar proctotrupid which occurs in the nests of *Solenopsis fugax* in Europe, and it is interesting to note the occurrence of this somewhat similar form with our North American *Solenopsis molesta*, which resembles *S. fugax* in habits. It is apparently the first myrmecophile which has been found living with this species of *Solenopsis*, which is itself a facultative myrmecophile of other species of ants.